DOCUMENT RESUME

ED 371 037 TM 021 741

AUTHOR Winer, Laura R.; And Others
TITLE Enriching the Layers of Necessity Model.
PUB DATE Apr 94
NOTE 7p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 4-8, 1994).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Curriculum Design; *Designers; Elementary Secondary Education; Foreign Countries; *Instructional Design; Instructional Development; Models; Questionnaires; Surveys
IDENTIFIERS *Layers of Necessity Model; Research Replication

ABSTRACT

The Layers of Necessity Model developed by M. Tessmer and J. F. Wedman (1990 and following) proposes that designers create multiple layers of instructional design (ID) activities depending on the particularities of different design situations. To enrich the understanding of the model, a replication was conducted of a study conducted in 1992. Subjects were 66 members of the National Society for Performance and Instruction (NSPI) (Canada). The questionnaire asked how often subjects performed particular activities in ID in a variety of contexts. Questions about the individual's introduction to ID and the references the subject found most useful were added. Responses indicate that there is a consensus among practitioners that the 11 listed tasks form the core of the ID process. While some respondents added tasks, others deleted some to emphasize different aspects of ID. Although there was great heterogeneity of introduction to ID, responses were surprisingly homogeneous. Differences between these responses and those of the previous study are analyzed. One table presents survey findings. (Contains 6 references.) (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
LAURA WINER
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ED 371 037

Enriching the Layers of Necessity Model

Laura R. Winer and Jesús A. Vázquez-Abad
Université de Montréal, Faculty of Education

Martin Tessmer
University of South Alabama,
Department of Behavioral Studies and Educational Technology

Paper presented at the Annual Meeting of AERA
April 6, 1994
New Orleans, Louisiana

Introduction

The Layers of Necessity Model developed by Tessmer and Wedman (Tessmer & Wedman, 1990, 1992; Wedman & Tessmer, 1990, 1991, 1993) proposes that designers create multiple layers of instructional design activities depending on the particularities of different design situations. This model was developed to understand the practice of instructional design and guide designers in approaching a given project. In order to enrich the understanding of the Layers of Necessity Model, the study presented at AERA in 1992 (Wedman & Tessmer, 1993) was replicated in Montreal in 1993. The target population, all members of the local chapter of the National Society for Performance and Instruction (NSPI), was similar to the original study in that subjects are familiar in principle with the theory and practice of ID in a variety of contexts. The survey instrument asks for a report on how often each of the following 11 activities in ID projects is performed and the reason(s) for omission.

1 We conduct a needs assessment.
2 We determine if need can be solved by training.
3 We write learning objectives.
4 We conduct task analyses.
5 We identify the types of learning outcomes.
6 We assess trainee's entry skills and characteristics.
7 We develop test items.
8 We select instructional strategies for training.
9 We select media formats for the training.
10 We pilot test instruction before completion.
11 We do a follow-up evaluation of the training after implementation.

In the Montreal study, questions about the individual's introduction to ID and the references that he/she considered the most useful and influential were added. This was done to determine if any "schools" of ID practice could be detected.

Address for correspondence:
Dr. Laura R. Winer
LIDÉ, Faculty of Education, Université de Montréal
Pav. 520 Côte Ste-Catherine, C.P. 6128, Station A
Montréal, Qc H3C 3J7
E-mail: WinerL@ere.UMontreal.ca

BEST COPY AVAILABLE

TM021741

The Replication Study

Questionnaires were mailed to all members of NSPI-Montreal (n=246); the response rate was 28% with seventy questionnaires received. Four questionnaires were excluded because the respondents stated that they had no relevant work experience. The respondents represented a variety of hierarchical levels, job duties, location and experience.

- distribution by Job Title shows 36% of respondents as Managers, 35% as Trainers, 20% as Consultants, 7.5% Academics and 1.5% as Instructors (stand-up delivery only).
- 89% of respondents work in business and industry, with 55% in an organization whose primary function is not training.
- 60% had design or development tasks as part of their current responsibilities. 55% of respondents were responsible for executing ID projects, and 36% had management responsibilities.
- 15% had duties other than teaching/training or designing/developing; 17% had no development responsibilities.
- years of experience ranged from 1 to 35 with a mean of 13 and a standard deviation of 8; 89% of the respondents had more than 5 years of experience.

The Findings

Introduction to ID and References: Almost half of the respondents (47%) were introduced to ID through formal university studies in Educational Technology or other programs. The next largest group (29%) was introduced to ID through work. For the remaining, 16% were introduced through personal contacts, 5% through workshops, and 3% through NSPI.

The questions about what references were used in introduction to ID or were currently useful and/or influential resulted in a list of 68 items. The breadth of references cited was interesting. From Workshop and NSPI documentation and In-house materials to Rossett, Robinson & Robinson, and Senge to basics (old and new) such as Bloom, Dick & Carey, Gagné, Gilbert, Harless, Kaufman, Mager, and *The Handbook of Human Performance Technology* to classics such as Socrates and Skinner and local influences such as Pask, Romiszowski and Stolovitch (who teach or have taught at Concordia University and Université de Montréal). There is clearly no common Bible.

What is surprising is that in spite of the heterogeneity of the introduction to ID and the references, responses to the questionnaire were homogeneous. This may indicate that regardless of the sources of design guidance, Montreal NSPIers tend to follow the same practice.

Homogeneity of responses: Table 1 presents the distribution of responses for each step. There was general agreement (80%) that all 11 steps listed were part of the ID process. This indicates that the respondents thought that the survey instrument validly reflected the ID process. Six respondents said that "Needs Assessment" and "Determining if training is needed" were part of Performance Technology, front-end or predesign processes rather than ID per se; two identified "Follow-up evaluation" as "useful but not part of" ID. Additions to the process were: production of instructional materials, summative evaluation, hiring trainers, cost/benefit analysis (one respondent each) and

context analysis, implementation planning, time and action scheduling, responsibilities and role distribution and budgeting (two respondents each).

Step	never	rarely	usually	always	total responses
needs assessment	0	16	33	17	66
need training	6	11	23	24	64
learning objectives	0	2	14	50	66
task analysis	3	14	24	25	66
learning outcomes	2	7	21	33	63
assess trainee	3	13	20	30	66
test items	3	13	21	29	66
instructional strategies	0	3	21	42	66
media formats	1	4	20	41	66
pilot test	6	9	21	30	66
follow-up evaluation	4	19	28	14	65

Table 1: Distribution of responses for each step

The population is quite homogeneous in that their responses do not seem to be influenced by factors which one might have thought important. The responses to the "How often do you do this on ID projects?" part of the questionnaire were compared by: *Job Title*: (Managers vs. Trainers vs. Consultants); *Primary Position*: (Member of Training Company and Independent Trainers vs. Member of Large Organization); *Job Duties*: (Teaching but not Designing or Developing vs. Designing or Developing but not Teaching); *Introduction to Instructional Design*: (Formal University Studies vs. Through work vs. Informal [workshops, NSPI, personal contacts]); *Years of Experience*. No significant differences were found (all p's > .05).

The questionnaire provided six reasons to choose from for not performing different steps, with space to write in others, if necessary. The provided reasons were:

1 Lack expertise
2 Client won't support
3 Decision already made
4 Considered unnecessary
5 Not enough time
6 Not enough money.

Not surprisingly, "Lack expertise" was cited least often as a reason for not doing something. The ranking of the reasons was:

- Decision already made (115 citations)
- Not enough time (94 citations)
- Considered unnecessary (92 citations)
- Client won't support (92 citations)
- Not enough money (48 citations)
- Lack expertise (29 citations).

Differences with previous study: Comparing the distribution of responses for those who "regularly" (Always + Usually) perform each of the steps from Wedman &

Tessmer (1993) and the Montreal group, there is a significant difference ($p<.05$). Both 6 -*Assess Trainee* and 10 - *Pilot Testing* must be eliminated for the results to be non-significant. The Montreal sample regularly assesses trainees 75.8% of the time compared to 54% for the Wedman and Tessmer sample. Pilot testing is regularly performed by 77.3% of the Montreal sample as compared to 49% of the 1992 sample.

The reasons given for not performing the different steps were examined. Reason 4 - *Considered Unnecessary* was judged to be qualitatively different from the others. Reasons 1, 2, 3, 5 & 6 all reflect elements of the environmental context in which a project is being carried out. For example, there are limited resources, or a particular client does not see the value of a given step. However, Reason 4 reflects the attitude of the Instructional Designer: he or she does not consider that step to be crucial to the success of the project. For that reason, the pattern of responses for Reason 4 was compared: Were there significant differences between Wedman and Tessmer and Montreal on which steps were considered unnecessary more often? The answer is Yes (chi square significant at $p<.05$); however when *Pilot Testing* is removed, there is no longer a significant difference. This confirms the difference noted above concerning *Pilot Testing*. It would appear that there is a difference in both practice and attitude towards this step.

The overall pattern of responses for the reasons given for not performing different steps was also analyzed. The results were significant for reasons 2 and 4. Reason 4 is explained by the difference in attitude to *Pilot Testing*. Reason 2 (*Client won't support*) was given less often by Wedman and Tessmer; this may be explained by the fact that 40% of their sample worked at the same organization, reducing the number of clients that the sample was dealing with.

The next question we asked was, "When a step is omitted, is it because of environmental considerations or because the Instructional Designer does not think it necessary?" To answer this we looked at the ranking of the different steps in "How often they are performed" and "How often they are perceived unnecessary".

Most often performed to Least often performed		Perceived as Most necessary to Perceived as Least necessary	
1	Learning Objectives	1	Instructional Strategies
2	Instructional Strategies		Media Formats
3	Media Formats	3	Learning Objectives
4	Learning Outcomes		Pilot Test
5	Pilot Test	5	Learning Outcomes
6	Test Items	6	Test Items
	Assess Trainee	7	Assess Trainee
	Needs Assessment		Need Training
9	Task Analysis	9	Follow-up Evaluation
10	Need Training	10	Needs Assessment
11	Follow-up Evaluation	11	Task Analysis

The most necessary activities are an intriguing list. This shows that follow-up evaluation, needs assessment and task analysis are not only performed least often but are considered least necessary by respondents. This can be a more damning indictment of them than low frequency alone because they are not perceived as vital to the design process.

"Model" Designers: Three respondents indicated that they "Always" performed all of the 11 activities, four reported "Always" doing every one except for Follow-up Evaluation only "Usually" because the "Client won't support", and one said that Needs Assessment was "Usually" done when the decision was not already made. There would seem, then, to be a small number of "model" designers who actually follow all of the steps all of the time. The majority, however, conform to the principle behind the Layers of Necessity model.

Main points

The analysis of the questionnaire alone and in comparison with previous work allows us to make three observations. The fact that we received more homogeneous responses from a more heterogeneous group contributes to validating the instrument's description of the ID process. It also allows us to make some general statements about what IDers do, and why they do not perform certain steps.

Secondly, there is a significant difference in both practice and attitude toward Pilot testing, while the balance of the answers confirms results from the previous study. This indicates that Pilot testing in particular warrants further study as to how it is perceived and performed.

Finally, there is a parallel between the steps which are perceived as most necessary and those which are performed most frequently. This would indicate that IDers complete more often those steps which they consider important, and leave out more often those which they consider less important. This begs the question of why the perceived importance of steps varies, in which context, and under what circumstances.

Exploratory Interviews

A small number of respondents (3) were subsequently interviewed in order to explore some questions raised by the analysis. Some general comments and issues raised will be presented below.

The concept of organizational culture is one which appears to be central to looking at ID practice. Two of our interviewees were consultants who work for a variety of companies, and their responses reflected the importance of considering the customs and practices of the different organizations. The interviewee who worked for a large corporation cited on several occasions the fact that several steps were simply "not done" where he worked.

This ties in to an interesting point concerning assessing trainees, a step which the Montreal group claimed to perform more often than found in the previous Layers of Necessity studies. On the one hand, there is in the training culture at large a growing concern with looking at individual differences and diversity in the workplace. The data from Montreal may be reflecting a general trend towards paying more attention to characteristics and qualities of individual trainees or a local preoccupation with differences due to the heterogeneity of the milieu. However, it is important to remember that there is little point in carrying out extensive analyses of learners if the subsequent interventions are not sophisticated enough to adapt to the differences identified. For an organization which

has a fairly stable and homogenous trainee population and traditional training techniques, investing time and money in learner analysis may simply not be cost-effective.

The apparent increase in the performance of pilot testing may also reflect the relative recency of the Montreal data. With shrinking budgets, more importance is given to "getting it right" and not wasting people's time or money. This increase could also be signaling the trend already noted in ID practice towards more prototyping (Winer & Vázquez-Abad, 1994).

Despite its low frequency, one consultant mentioned that he was observing increasing support for follow-up evaluation as clients want to make sure that the desired effects are in fact being achieved and that money is not being wasted. The low frequency may come, in part, from the fact that these evaluations are often carried out by in-house personnel. This is in marked contrast to the corporate interviewee, who found that evaluation after implementation had three strikes against it: it was not in the organizational culture; no one in-house could imagine how to go about doing it; and the people were afraid of what they might find out if they did it!

The reason most often cited for not performing the different steps was "decision already made". This indicates that the people involved in designing, developing and delivering training are often not part of the decision process as to whether the problem is one which is appropriately addressed by training. The interviewee from a corporate setting hoped that with the shift towards Performance Technology occurring in his company, this reason may, over time, become one which is cited less frequently.

Conclusion

Responses to this survey have led us to believe that there is a consensus among practitioners on the fact that the 11 tasks listed form the core of the ID process. Important insights were provided by those who had differing opinions; some added tasks remind us that the ID practitioner deals also with management issues, and some "deleted" tasks place ID as part of a larger activity. What tasks were seen as necessary provides additional understanding of ID in practice.

References

Tessmer, M. & Wedman, J.F. (1992). Decision-making factors and principles for selecting a layer of instructional development activities. *Performance and Instruction, 31* (4), 1-6.

Tessmer, M. & Wedman, J.F. (1990). A layers-of-necessity instructional development model. *Educational Technology Research & Development, 38* (2), 77-85.

Wedman, J.F. & Tessmer, M. (1993). Instructional Designers' Decisions and Priorities: A Survey of Design Practice. *Performance Improvement Quarterly, 6* (2), 43-57.

Wedman, J.F. & Tessmer, M. (1991). Adapting instructional design to project circumstance: The layers of necessity model. *Educational Technology, 31* (7), 48-52.

Wedman, J.F. & Tessmer, M. (1990). The "Layers of Necessity" ID model. *Performance & Instruction, 29* (4) 1-8.

Winer, L.R. & Vázquez-Abad, J. (1994, February). Design Practice. Paper presented at the Annual meeting of AECT, Nashville, TN.